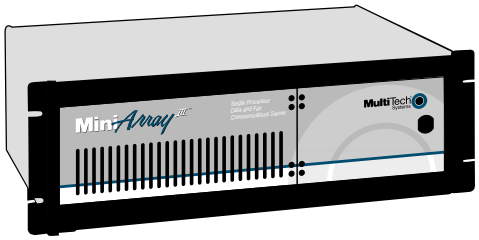
MiniArray III™



Model MA6

Single Processor

Data and Fax

Communications Server

Quick Start Guide

MultiTech® Systems

MiniArray III Model MA6 Communications Server
Quick Start Guide

82067052, Revision C

Record of Revisions

Revision	Description
A	Manual released. All pages at revision A. (10/30/98)
B	Add appendices on Workstation Redirectors and RADIUS. Revise RASExpress info (1/14/2000)
C	Update phone info; remove info on BBS and FAX-back (11/06/00).

Patents
This product is covered by one or more of the following U.S. Patent Numbers: ***5.301.274; 5.309.562***; ***5.355.365; 5.355.653; 5.452.289; 5.453.986***. Other Patents Pending.

TrademarksTrademarks of Multi-Tech Systems, Inc. are as follows: MiniArray, RASExpress, MultiExpressFax, and the Multi-Tech logo. CompuServe is a trademark of CompuServe, Inc.

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, Minnesota 55112
(763) 785-3500 or (800) 328-9717
Fax (763) 785-9874
Tech Support (800) 972-2439
Internet Address: http://www.multitech.com

Contents

1 System Overview

Introduction 6
Product Overview 6
RASExpress & Auxiliary Software 6
Documentation Set Overview 8
Configurations 8
Technical Specifications 9

2 Installing Your MiniArray III Model MA6

Introduction 12
Unpacking 12
Safety Warnings: AC Power, Lithium Battery, Laser Caution, ... 12
Telecom Warnings 13
Rack Mounting 13
Cable Connections 13
Powering Up 16

3 Getting Started with RASExpress

Quick Start with RASExpress 18

4 Hardware Removal and Replacement

Introduction 24
Disconnecting Cables & Removing from Enclosure 24
Card Cage Removal/Replacement 25
Board Removal/Replacement 27
Hard Disk Removal/Replacement 29
Floppy Disk Removal/Replacement 29
CDROM Removal/Replacement 30
Power Supply Removal/Replacement 30

5 Troubleshooting 34

6 Service, Warranty, and Technical Support

Introduction 38
Limited Warranty 38
Warranty Addendum for Service on North American Products 38
Warranty Addendum for Service on International Products 39
Out of Warranty Repair Costs 39
Tech Support 39
About the Internet 40

Appendices

Appendix A—Back Panel Connector Pinouts 42
Appendix B—Regulatory Information 48
Appendix C—Workstation Redirectors -- MCSIWSN & WINMCSI 55
Appendix D—RADIUS Authentication & User Profile Software 63
Appendix E—MultiManager Software 67

1 System Overview

Introduction

The MiniArray ™ is a single-segment rack mountable solution that's customized for dedicated turnkey operation as a LAN-based communications, remote access, or fax server. The MiniArray is a general purpose, turnkey communications server that easily interfaces to any existing Novell, Windows NT or IP network.

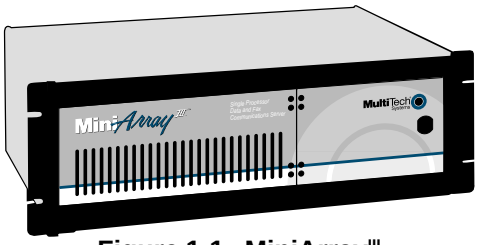


Figure 1-1. MiniArray

Product Overview

The MiniArray Model MA6 is a ruggedized, highly expandable 19" rack mount device that includes a built-in hard drive, 3.5" floppy drive, and also contains a slot for a CD-ROM drive. The heart of the MA6 is MultiTech's high-powered Pentium-based single-board computer (SBC) with up to 200 MHz of processing power. The MA6 has five expansion slots, four that meet the ISA standard, and one that accommodates either ISA or PCI devices. A user configurable card cage allows for up to 32 enhanced V.34 (33.6 bps) internal modems or up to 32 high speed serial ports.

The MiniArray is shipped with RASExpress remote access server and MultiManager software installed. Two MiniArray Model 6 versions are shipped; one is equipped with RASExpress software and internal modems, and the other has RASExpress software and serial ports for external communications devices. Both have a default configuration that allows them to boot up as remote-access servers (RAS).

RAS*Express and Auxiliary Software*

The MiniArray's factory-installed RAS*Express* software is an advanced remote-access software package that enables network managers to configure and manage remote servers via web browsers, through Telnet over an IP network, and via a GUI manager over both IP and IPX networks. Through a special software package bundled with the MiniArray, RAS*Express* can also be interfaced to standard RADIUS authentication functionality (which resides on a separate PC).

RADIUS authentication software (Remote Authentication Dial-In User Service) handles authentication and profile information about network users and ensures security against unauthorized server access. Built-in R log protocol support permits remote log-in to all hosts on the network. RAS*Express* can facilitate remote software upgrades via standard TFTP protocol.

The MiniArray's workstation re-director programs (WINMCSI and MCSIWSN) control modem port assignments on the network.

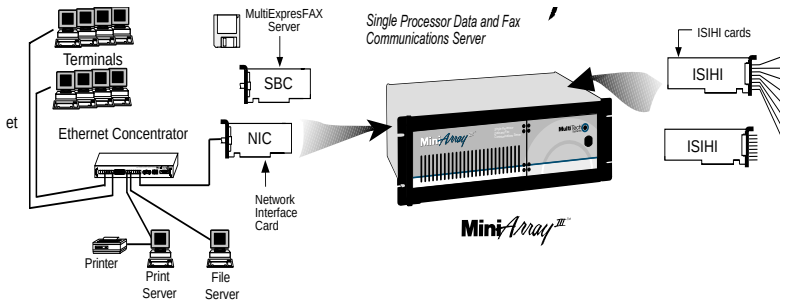


Figure 1-2. Typical RASExpress Application

Additional noteworthy features of RAS*Express* include include:

- Support for DHCP, a time saving feature that dynamically allocates IP addresses instead of requiring network managers to allocate them manually
- Built-in SNMP agent enables third-party SNMP manager to administer the box
- Support of IP and IPX header compression and IP VJC header compression for increased performance
- Call back support for Windows 95 client
- Remote Access Security on a per use basis for accessing IP only, IPX only, or both IP and IPX
- Keyboard or mouse operation
- Standard or User-defineable cover page
- Built-in web, telnet, and FTP access

Other noteworthy features include:

- A DOS client that supports one local phone book with 500 groups and 4,000 recipients.
- A WindowsTM client that supports unlimited phone books with 1,000 groups and 1,000 recipients.
- DOS user interface with Pop-up menus, context-sensitive Help, and hot-key TSR activation.

Documentation Set Overview

The MiniArray^{III} documentation set consists of this Quick Start Guide and a complete set of hardware and software manuals on CD-ROM. Updates are available from the Multi-Tech web site and FTP site.

Manual Set

Please refer to the list below for the individual titles included in your MiniArray^{III} documentation set.

System Overview
Single Board Computer - Models MSB133Px, MSB166Px, and MSB200Px
PCI Ethernet Network Interface Card (10/100 Mb)
Intelligent Serial Interface Card with Integrated Data/Fax Modems - Model ISI3334
Intelligent Serial Interface (ISI) - Model ISI4608PC
RASExpress User Guide

Configurations

The Multi-Tech MiniArray^{III} can be configured in a number of ways. Your reseller has the option of installing additional upgrades that can offer up to 32 modems in each MiniArray^{III}, as well as a number of application software packages.

Technical Specifications

The MiniArray^{III} conforms to the following technical specifications.

Chassis

- 6-slot PCI/ISA backplane
- SBC
- PCI Ethernet Network Interface Card (10/100 Mb)
- One half-height 1.44Mb 3½-inch floppy disk drive
- One half-height 500 *plus* megabyte hard disk drive
- One power supply
- Power on/off switch on front panel with built in Power LED.
- Full security locking
- Intelligent Serial Interface (ISI3334 or ISI4608) optional

Power Supply

AC Input

- Power Requirement: 100-120/220-240V; 3A
- Frequency: 50-60 Hz
- Efficiency:>65% @ full load, nominal line

DC Output

- Output: +5 @ 18A
  +12 @ 6A
  -5 @ 0.3A
  -12 @ 0.8A
- Inrush Current<50A peak @ 115VAC, cold start at 25° C
- Line Regulation:+/- 5% at full load for +/-5V, +/-12V, +/-10% for -12V
- Hold Time:20ms at full load @ 115VAC

Dimensions

- Height:5.25 inches
- Width: 19 inches
- Depth: 17 inches
- Weight: 31 lbs. (14kg)

Environmental

- Temperature:0-40° C
- Humidity: 10-90% RH Non Condensing
- Fan Rating: 25 cfm

2 Installing Your MiniArray III Model MA6

Introduction

This chapter explains how to set up and cable the MiniArray™.

This product, as received by the end-user, is ready to be connected to the end-user's Ethernet concentrator and is preconfigured to operate as a communication server once your modem connections are made, VGA monitor and keyboard are linked up, the system booted, and some basic information entered. To connect the cables to the SBC, NIC, or ISI board, refer to the "Cable Connections" section of this chapter.

Unpacking

Check the items on the MiniArray™ shipping list to ensure that you have received the correct options and accessories. Unpack and inspect the cabinet for visible shipping damage. If damage is observed, do not power-on the unit; contact Multi-Tech's Tech Support for advice. If no damage is observed, place the MiniArray™ in its final location.

Safety Warning AC Power

Locate the AC outlet near the communication equipment. The AC power cord is your main AC disconnecting device and must be easily accessible at all times. For your safety, the power cord provided with your system has a grounded plug. Always use the power cord with a properly grounded wall outlet, to avoid the risk of electrical shock.

Lithium Battery Caution

A lithium battery on the product provides backup power for the devices timekeeping capability. The battery has an estimated life expectancy of ten years.

When the battery starts to weaken, the date and time may be incorrect. If the battery fails, the unit must be sent back to Multi-Tech systems for battery replacement.

Warning: There is danger of explosion if the battery is incorrectly replaced.

Laser Safety Caution

Class 1 LED Product.

The CD-ROM drive contains a laser system and is classified as a " Class 1 Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968.

Should the unit ever require maintenance, contact an authorized repair location.

Safety Warnings Telecom

1. Never install telephone wiring during a lighting storm.

2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

3. This product is to be used with UL and cUL listed computers.

4. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

5. Use caution when installing or modifying telephone lines.

6. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.

7. Do not use the telephone to report a gas leak in the vicinity of the leak.

8. To reduce the risk of fire, use only No. 26 AWG or larger Telecommunication line

Cord.

Rack Mounting

Caution

In order to prevent injury or damage to the unit, it is recommended that two people mount the MiniArray™ in the rack enclosure

The MiniArray™ is designed to mount in a standard 19-inch rack enclosure. Four (4) rack enclosure mounting screws are provided in your MiniArray™ kit. Use these screws to mount the unit securely to the rack enclosure.

Note

In order to maintain proper operating temperatures, there is a one-inch clearance requirement for the back of the unit. If mounted in a rack enclosure or as a desktop unit, there must be a minimum of one inch between the back of the MiniArray™ and any wall or barrier, and the front of the MiniArray™ and any wall or barrier.

Cable Connections

The cabling required for the MiniArray™ involves connecting the ISI board(s) to the modems; or in the case of integrated multiport ISI/Modem, plugging the RJ11 cables into the multiport ISI/Modem modular receptacles; and a NIC connection to the network. The SBC board has cable connectors for adding a monitor and keyboard. Cable connectors and boards are shown in Figure 2-1.

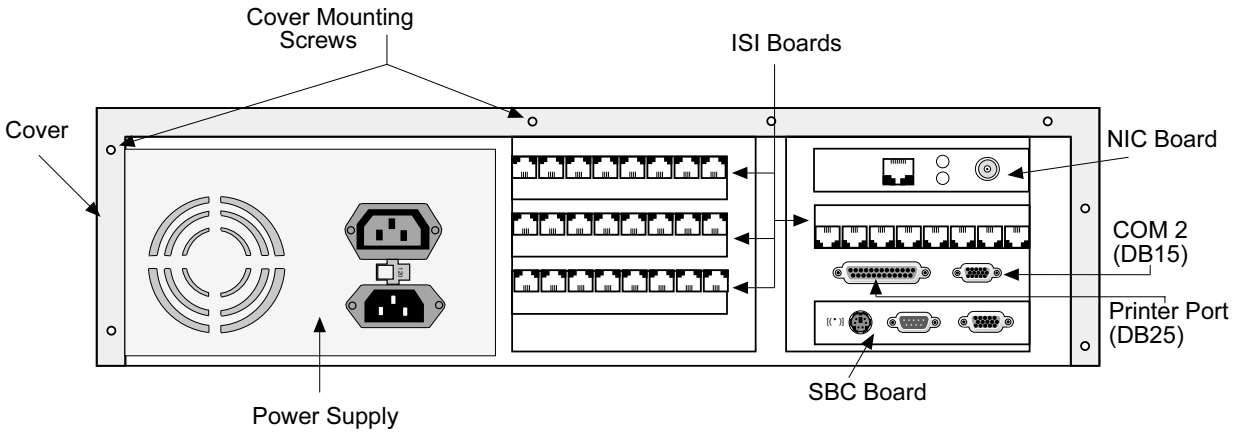


Figure 2-1. Back Panel Connectors

SBC Board Cabling

The SBC board is located in the MiniArray^{III} as shown in Figure 2-1. The SBC board cabling may involve connection to three back panel connectors (see Figure 2-2). The back panel connectors are:

- Video connector
- COM 1 connector
- Keyboard connector

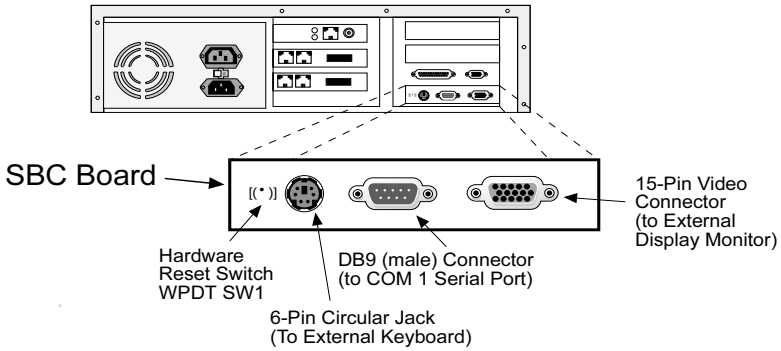


Fig. 2-2. SBC Board Connections

The right connector on the SBC board connects the video cable to a monitor. The left round connector is for the keyboard. The middle connector is COM 1. The SBC connector pinouts are shown and defined in Appendix A.

Note

Any cables connected to the MiniArray^{III} should be shielded to reduce interference

ISI Board Cabling

Each ISI3334/8 board takes up one physical slot in the MiniArray[III]. Depending on your configuration, you may have a total of up to four (4) cards (see figure 2-1). Attach the RJ11 line cords to the RJ11 line connectors on the ISI card(s) at the back of your MiniArray[III], as shown in Figure 2-3.

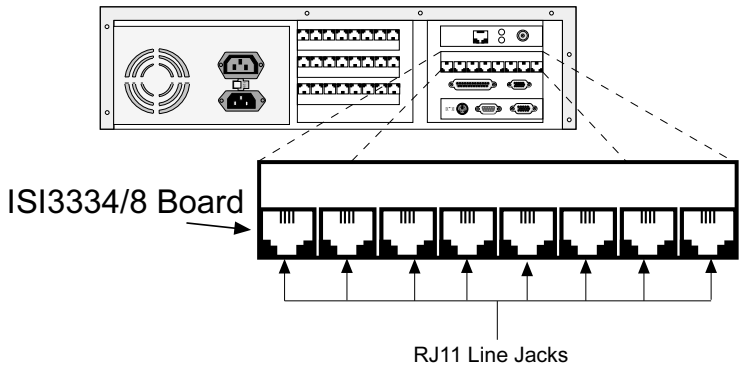


Fig. 2-3. ISI Board Connectors

Note
Any cables connected to the MiniArray[III] should be shielded to reduce interference.

NIC Cabling

The EN-series EtherNet NIC is located as shown in Figure 2-4. The NIC connectors are of theUTP (RJ45 connector) type.

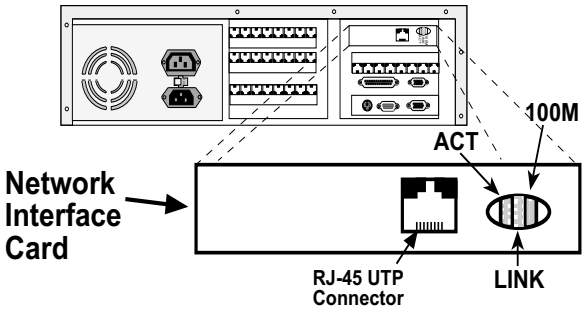


Fig. 2-4. NIC Board Connector

Connect the appropriate network cable to the NIC in the MiniArray[III]. The various NIC connectors are shown and defined in Appendix A.

Note
Any cables connected to the MiniArray[III] should be shielded to reduce interference.

Powering Up

Note: This is plugable equipment; the socket outlet must be installed near the equipment and must be easily accessible.

Make sure that the voltage selector on the power supply is set to the proper voltage prior to connecting this equipment to the main power. If the voltage selector needs to be changed, an ordinary pencil can be used to change the switch to the position which best correlates with the known input voltage. If the voltage selector is in the "115" position, input voltages from 100-120VAC may be applied to the equipment. If the voltage selector is in the "230" position, input voltages from 200-240 VAC may be applied to the equipment.

Connect the power cord supplied with the MiniArray™ to the power cord connector on the back of the cabinet and to an AC outlet. Press the power switch on the front of the cabinet to the ON position. The power switch contains an LED which should light when power is applied.

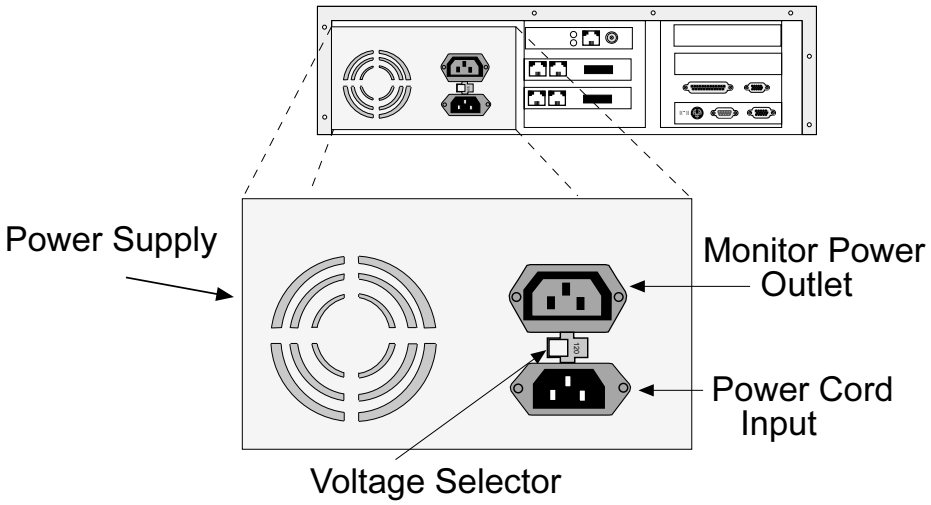


Fig. 2-5. Power Supply Connectors

3 Getting Started with RASExpress

Quick Start with RAS*Express*

MultiTech Systems has pre-installed RAS Server software on your MiniArray^{III} to make configuration as simple as possible. For your convenience, a copy of the RAS*Express* Installation disk is on the CD-ROM shipped with the MiniArray^{III}. Complete this procedure to put your MiniArray^{III} into operation as a RAS Server.

What you need to start

- The MiniArray^{III} Server
- A dumb terminal or an auxiliary PC (other than the MiniArray^{III} itself) that can operate in terminal mode
- A shielded RS-232C serial cable with a female DB-9 connector on one end and a connector to match the serial port of the terminal or auxiliary PC on the other end.
- An IP Address assigned to the MiniArray^{III} server
- An IP Subnet Mask assigned to the MiniArray^{III} server
- *Optional:* a client PC connected to the MiniArray^{III}'s network and equipped with Telnet, a browser, or MultiManager

Accessing RAS*Express*

To configure the MiniArray^{III} as a RAS*Express* server, you must first connect a terminal or auxiliary PC to the MiniArray^{III}'s serial port. Then you must enable **IP Remote Access** and then program the **IP Address** and **IP Subnet Mask** into the MiniArray^{III}. After the IP Address and IP Subnet Mask have been entered into the MiniArray^{III}, you can either:

(a) continue using the terminal or auxiliary PC to program other network settings into the MiniArray^{III}, or
(b) re-boot the MiniArray^{III} and then continue programming the MiniArray^{III}'s network settings from a client PC connected to the LAN in which the MiniArray^{III} is the RAS server.
Do this using Telnet, or a browser, or MultiManager.

The steps for both methods are presented below.

Method A. Do All Configuration using Terminal or Auxiliary PC

A1. Be sure that the MiniArray^{III} is connected to the LAN. Turn off the power for the MiniArray^{III}.

A2. Using the provided RS-232C serial cable, connect a terminal (or an auxiliary PC) to the MiniArray^{III}'s serial port.

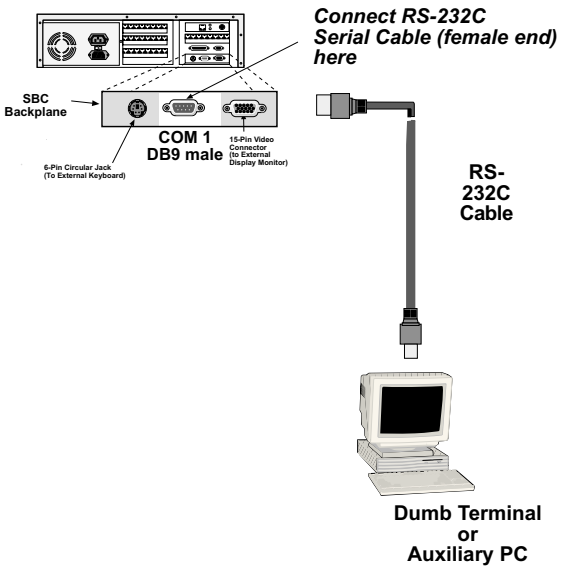


Figure 3-1: Serial port on the MiniArray^{III}

A3. Power up the MiniArray^{III}. The RAS*Express* Server Screen will appear.

Note: The server takes a few moments to load the RASExpress software and to initialize the modems after it is turned on. Observe RAS software processing and displaying .

A4. Turn on the terminal (or auxiliary PC) and press `Enter`.

A5. Select `Quick Configuration of Server`.

A6. Enable **`IP Remote Access`**.

Note: Error messages will appear and will indicate that the remote addresses of the WAN ports are not on the same subnet. This is normal for the initial setup. Ignore these messages.

A7. Type the **`IP Address`** for the CommPlete RAS*Express* server.

A8. Type the **`IP Subnet Mask.`**

A9. In the **`IP Default Route`** field, enter the router address for the LAN's file server.

A10. If you want the RASExpress server to use IP Routing Information Protocol (RIP-2) for for IP routing, enable **`IP RIP`**.

A11. If you have enabled IP-RIP, you may enable **`IP Auto Learn Default Gateway`**. When enabled, the RAS*Express* server will learn the correct default gateway if it was configured incorrectly or if the configured gateway goes down and a different router starts acting as a default router.

A12. In the **`Primary Name Server`** field and the **`Secondary Name Server`** fields, type `000.000.000.000`
unless you have made other arrangements.

A13. In the **`IP Frame Type`** field, select the frame type that fits your LAN, either **`TYPE_II`** (the default value), or **`SNAP`** (Sub-Network Access Protocol).

A14. If you set the **`Remote Client IP Address`** field to the value **`Configure Per Port`**, follow these steps when this this present Quick Configuration procedure is done:

i. From the terminal main menu, select Configuration of server

ii. Select Communication Setup.

iii. Select ISI Setup.

iv. Delete all ISI cards before saving and rebooting the server.

These steps correct the initial subnet error the next time the server loads.

If you set the **`Remote Client IP Address`** to any of these values (**`Use DHCP, or Use Address, Use Radius`**), go to step A15.

A15. When the above steps are complete, press Esc and save the changes to disk. You will be asked to re-boot the server.

A16. Type Y and press Enter. The connection closes while the RAS*Express* server re-boots. A new menu appears after the MiniArray**III** has re-booted.

A17. To complete the configuration of the RASExpress server, select Configuration of server from the main menu. For detailed information about the menu options, see Chapter 3 of the RAS*Express* manual.

Method B. Start Configuration with Terminal, Finish Configuration on Client PC

To enable remote configuration of the RASExpress server, you must first configure the server's IP settings, including the server's IP address. To do this, you must connect a terminal (or auxiliary PC) to the server's serial port. After IP is configured and working, you can complete the server configuration remotely through Telnet, through a browser, or through MultiManager on a client PC connected to the LAN.

B1. Be sure that the MiniArray**III** is connected to the LAN. Turn off the power for the MiniArray**III**.

B2. Using the provided RS-232C serial cable, connect a terminal to the RASExpress server's configuration port.

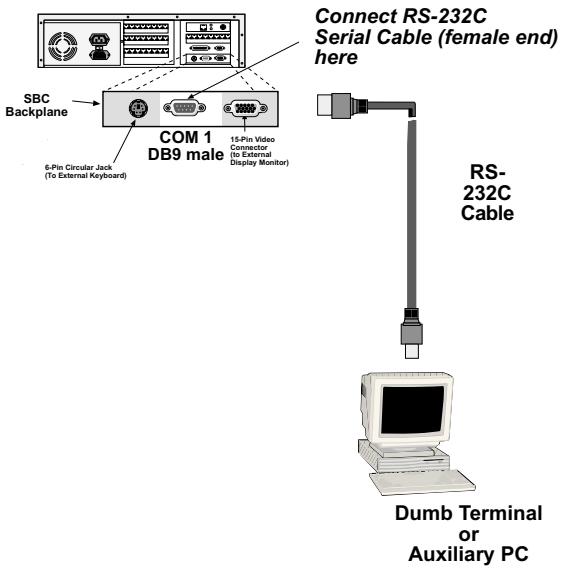


Figure 3-2: Serial port on the MiniArray III

B3. Power up the MiniArray**III**. The RAS*Express* Server Screen will appear.

Note: The server takes a few moments to load the RASExpress software and to initialize the modems after it si turned on.Observe RAS software processing and displaying .

B4. Turn on the terminal (or auxiliary PC) and press `Enter`.

B5. Select **`Quick Configuration of Server`**.

B6. Enable **`IP Remote Access`**.

Note: Error messages will appear and will indicate that the remote addresses of the WAN ports are not on the same subnet. This is normal for the initial setup. Ignore these messages.

B7. Type the **`IP Address`** for the MiniArray**III** RAS*Express* server.

B8. Type the **`IP Subnet Mask.`**

`B9.` Re-boot the MiniArray**III**.

B10. Using Telnet for access requires that a TCP/IP protocol stack be loaded on the client PC. Telnet access is possible both by dialing in through the RASExpress server and, more commonly , through the LAN or Internet.

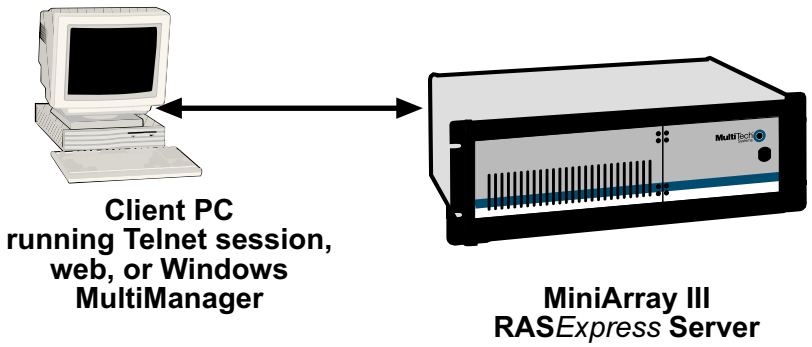


Figure 3-3. Setup for completing RAS*Express* configuration from client PC

At a client PC connected to the LAN in which the MiniArray^{III} is the RAS server, start a Telnet session using either dial-in access or TCP/IP access.

Using Dial-In Access

- Dial in to the RAS*Express* server using a terminal program. A login prompt appears.
- Enter a user name and password. A menu appears.
- Select Telnet Session from the menu.
- Enter the IP address of the RASExpress server.
- The RASExpress main menu appears.

Using TCP/IP Access

- Run your Telnet software and connect to the IP address of the RASExpress server.
- The RASExpress main menu appears.

B11. At the Telnet main menu, select Configuration of server.

B12. Set network parameters as described in items A9 through A17 as described in Method A Above.

4 Hardware Removal and Replacement

Introduction

This chapter provides procedures for removing and replacing the key hardware components of the MiniArray^{III}. Before removing or replacing any component, be sure to perform the procedures in Table 4.1 which describes the process for disconnecting cables from the back of the MiniArray^{III}, and removing the MiniArray^{III} from the rack enclosure. Your MiniArray^{III} has been designed to make this process as efficient as possible, but if you experience problems, contact Multi-Tech Technical Support, refer to chapter 6 of this section.

Disconnecting Cables and Removal from Enclosure

The following table describes the procedures for removing the MiniArray^{III} from its rack enclosure. These steps must be followed before any internal component can be removed or replaced.

Warning

Anytime power has to be removed, turn off the Master Power switch inside the front door.

Note

In order to make re-connection easier, be sure to note or label all cable connections before disconnecting any cables from the MiniArray^{III}.

Table 4.1 Cable Disconnection and Rack Enclosure Removal Procedure

Step	Procedure
1	Remove the power cord from the back of the MiniArray^{III}.
2	If connected, disconnect the video, COM 2, and keyboard cables from the back of the SBC.

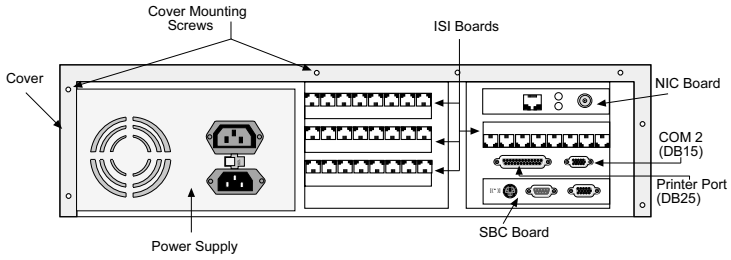


Fig.4-1. Back Panel Connectors

3 If LAN is connected to the MiniArray^{III}, disconnect the 10BaseT cable at the NIC.

4 Disconnect the telephone cords (RJ11) from the ISI board(s).

Note
You may have ISI boards located in the left and right halves of the card cage

Table 4.1 Cable Disconnection and Rack Enclosure Removal Procedure (cont'd.)

Caution
It is recommended that two people remove the MiniArray^{III} from its rack enclosure

5 Remove the four rack enclosure mounting screws from the front of MiniArray^{III} and remove the MiniArray^{III} from the rack enclosure. See Figure 4-2.

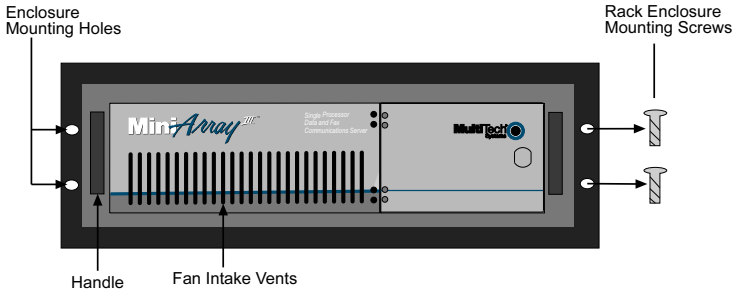


Fig. 4-2. Rack Enclosure Mounting Screws

6 To re-attach cables and re-mount the MiniArray^{III}, follow steps 1-5 in reverse.

Card Cage Removal/Replacement

The following table describes the process for removing the card cage. Note that card cage removal is not always necessary to remove or replace some components. If change will only be made to the SBC side of the card cage, the card cage does not need to be removed.

Table 4.2 Card Cage Removal Procedure

Step	Procedure
1	Remove the MiniArray^{III} from rack enclosure following the procedures in Table 4.1.
2	Remove the top cover from the MiniArray^{III} by removing the seven cover mounting screws located in the back of the MiniArray^{III}. The cover slides off the back of the chassis.

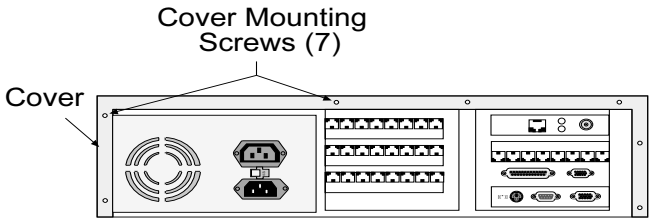


Fig. 4-3. Cover Mounting Screws

Table 4.2 Card Cage Removal Procedure (cont'd.)

Step	Procedure
3	Remove the chassis mounting screw from the card cage. See Figure 4-4.

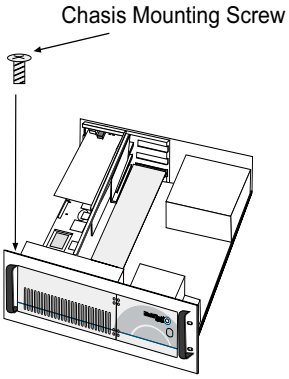


Fig. 4-4. Chassis Mounting Screw

4 Finish pulling the card cage (including fan enclosure) straight up and out of the chassis. See Figure 4-5. Set next to chassis.

Note

Before placing card cage back into chassis, verify that power connectors from the power supply to backplane are fully attached

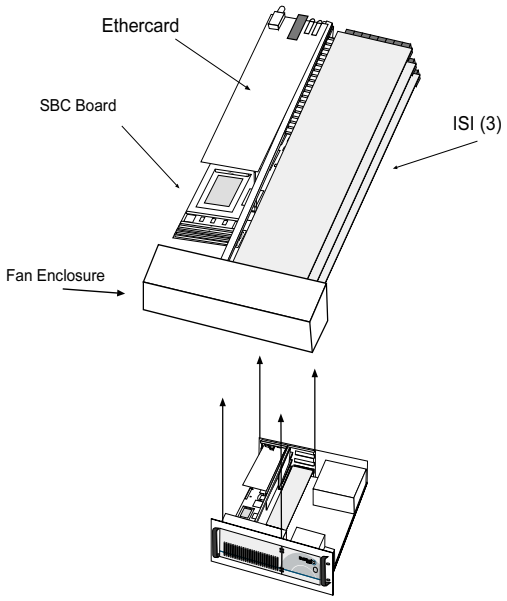


Fig. 4-5. Card Cage Removal

Board Removal/Replacement

Table 4.3 Board Removal/Replacement Procedure

Step	Procedure
	Removing SBC Board
1	Remove the MiniArray^{III} from rack enclosure following the procedures in Table 4.1.
2	Remove the top cover from the MiniArray^{III} by removing the seven cover mounting screws located in the back of the MiniArray^{III}. (See Figure 4-3.)
3	Disconnect the four ribbon cables from the SBC. (See Figure 4-6.) Depending on your configuration, you may not have all four ports in use.

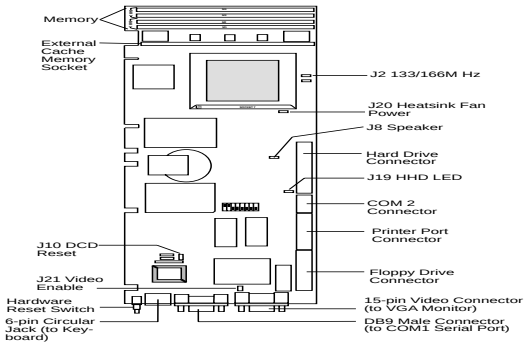


Fig. 4-6. SBC Board and Ribbon Cable Connectors

4 Remove the screw that secures the SBC board to the chassis at the back of the MiniArray[III].

5 Remove the SBC board from the midplane.

6 To replace the SBC board, verify SBC board configuration; refer to the Hardware Configuration and Installation instructions in the SBC manual.

7 Install the new SBC board by following steps 1-5 in reverse.

8 If other boards are being installed, perform those procedures below now, and then remount the MiniArray[III] in the enclosure. See Step 6 of Table 4.1.

Table 4.3Board Removal/Replacement Procedure (cont'd.)

Step Procedure

Removing NIC Board

1 Remove the MiniArray[III] from rack enclosure following the procedures in Table 4.1.

2 Remove the top cover from the MiniArray[III] by removing the seven cover mounting screws located in the back of the MiniArray[III]. See figure 4-3.

3 Remove the screw that secures the NIC board to the chassis at the back of the MiniArray[III].

4 Remove the NIC board from the midplane.

5 To replace the NIC board, verify NIC configuration; refer to the Installation Instructions in the appropriate NIC section of this manual.

6 Install the new NIC board by following steps 1-4 in reverse.

7 If other cards are being installed, perform those procedures below now, and then remount the MiniArray[III] in the enclosure. See Step 6 of Table 4.1.

Removing ISI Boards

Note

If removing or replacing the single ISI board on the left side (looking from the front) of the midplane, no card cage removal is necessary. Ignore steps 3 through 5.

1 Remove the MiniArray[III] from rack enclosure following the procedures in Table 4.1.

2 Remove the top cover from the MiniArray[III] by removing the seven cover mounting screws located in the back of the MiniArray[III]. See figure 4-3.

3 Remove the chasis mounting screw from the card cage. See figure 4-4.

4 Being careful to maintain slack in the power cables, lift the card cage up and over so that it can rest along side the chassis.

5 Remove the screw(s) that secures the ISI board(s) to the chasis at the back of the MiniArray^{III}.

6 Remove the ISI board(s) from the midplane.

7 To replace the ISI board(s), verify ISI board configuration; refer to the Installation Instructions in the ISI section of this manual.

8 Install the new ISI card(s) by following steps 1-6 in reverse.

Hard Disk Drive Removal/Replacement

Table 4.4 Hard Drive Removal/Replacement Procedure

Step	Procedure
1	Remove the MiniArray^{III} from rack enclosure following the procedures in Table 4.1.
2	Remove the top cover from the MiniArray^{III} by removing the seven cover mounting screws located in the back of the MiniArray^{III}. See figure 4-3.
	Note *If you are simply adding a hard drive and not replacing the existing hard drive, proceed to step 6.*
3	Disconnect the power and data cables from the back of the hard disk drive.
4	Remove the two screws securing the hard drive to the drive chassis.
5	Remove hard drive by sliding it off of the drive chassis, towards the back of the unit.
6	To install a new hard drive, follow steps 1-5 in reverse.

Floppy Disk Drive Removal/Replacement

Table 4.5 Floppy Drive Removal/Replacement Procedure

Step	Procedure
1	Remove the MiniArray^{III} from rack enclosure following the steps in Table 4.1.
2	Remove the top cover from the MiniArray^{III} by removing the seven cover mounting screws located in the back of the MiniArray^{III}. See figure 4-3.
3	Remove the chassis mounting screw from the card cage. See figure 4-4.
4	Being careful to maintain slack in the power cables, lift the card cage, including fan housing, up and over so that it can rest along side the chassis.

5 Disconnect the power and data cables from the back of the floppy disk drive.

6 Remove the four screws securing the floppy drive to the drive chassis.

7 Open the front door, remove floppy drive by sliding it out the front of the drive chassis.

8 To install a new floppy drive, follow steps 1-7 in reverse.

Note

Before installing card cage, make sure power connectors from power supply to midplane are fully connected.

CDROM Removal/Replacement

Table 4.6 CD ROM Removal/Replacement Procedure

Step	Procedure
1	Remove the MiniArray™ from rack enclosure following the steps in Table 4.1.
2	Remove the top cover from the MiniArray™ by removing the seven cover mounting screws located in the back of the MiniArray™. See figure 4-3.
3	Remove the chassis mounting screw from the card cage. See figure 4-4.
4	Being careful to maintain slack in the power cables, lift the card cage, including fan housing, up and over so that it can rest along side the chassis.
5	Disconnect the power and data cables from the back of the CDROM drive.
6	Remove the four screws securing the CDROM drive to the drive chassis.
7	Open the front door and remove CDROM drive by sliding it out the front of the drive chassis.
8	To install a new CDROM drive, follow steps 1-7 in reverse.

Note

Before installing card cage, make sure power connectors from power supply to midplane are fully connected.

Power Supply Removal/Replacement

The card cage has to be removed in order to disconnect the power wiring before the power supply can be removed.

Table 4.7 Power Supply Removal/Replacement Procedure

Step	Procedure
1	Remove the MiniArray™ from rack enclosure following the steps in Table 4.1.

2 Remove the top cover from the MiniArray^{III} by removing the seven cover mounting screws located in the back of the MiniArray^{III}. See figure 4-3.

3 Remove the chassis mounting screw from the card cage. See figure 4-4.

4 Partially remove the card cage and remove power cabling at midplane.

5 Remove power cables from the back of hard drive, floppy drive, and CD ROM drive.

6 Remove the three power supply mounting screws from the back of the MiniArray^{III}.

7 Remove the power supply from the chassis.

8 To install a new power supply, follow steps 1-7 in reverse.

5 Troubleshooting

Introduction

This chapter provides steps for solving problems if the MiniArray™ fails. Your MiniArray™ was thoroughly tested at the factory before it was shipped. If you are unable to make a successful connection, it is possible that the MiniArray™ is defective. However, it is more likely that the source of your problem lies elsewhere. As with any microcomputer product, start with simple hardware and software problems, and then work toward more complex problems (i.e., operating system and/or applications).

Troubleshooting

The following troubleshooting process addresses some of the typical problems and with some basic solutions. If a problem arises while you are in an application, refer to the software documentation.

- **No Video**
    - Verify that power is ON, and LED in power switch is lit.
    - Verify that SBC and any other adapter boards are connected properly. NOTE: Make sure to turn power OFF to reconnect boards.
    - Verify that monitor is turned ON, and verify that power is connected to monitor and video cable is connected to video connector on SBC.
    - Verify that two or four 72-pin, memory SIMMs are connected properly on the SBC. The SIMMs they must be the same brand, size and speed.
    - If some device other than a modem is connected to COM 1, verify that the DCD jumper is not installed.
    - Remove all connectors from the SBC and adapter boards, except the video connector, and then power ON the MiniArray™. If MiniArray™ now has video, then there is a problem with one of the cables or one of the peripherals. Try each cable, one at a time, to isolate the bad cable or peripheral.
    - Verify that fan in front of card cage is running. If power is on and fan is stopped, check to be sure power connectors from power supply to midplane are fully connected.
    - If problem persists, contact MultiTech's Technical Support Department, refer to Chapter 6 of this manual.
- **SBC does not boot correctly or hangs after video appears**
    - Run BIOS Setup Utility to verify correct configuration for system and drives (press <DEL> as system boots).
    - If boot PROM is used, verify that network and adapter card are configured properly to see the network.

- Verify that SBC and adapter boards are seated properly in ISA slot. NOTE: Make sure to turn power off to reconnect boards.
- Hard drive or floppy drive cables are not connected properly or parameters are not set properly in setup.
- Verify that enough memory is installed to load the intended applications.
- Verify that two or four 72-pin SIMMs are seated properly on the SBC. The SIMMs must be the same brand, size and speed.
- If some device other than a modem is connected to COM1, verify that the DCD jumper is not installed.
- Remove all adapter cards. If system boots there is a conflict with an adapter card.
- If problem persists, contact MultiTech's Technical Support Department, refer to Chapter 6 of this manual.

- **COM1, COM2 or LPT1 port does not respond correctly**
  - If some device other than a modem is connected to COM1, verify that the DCD jumper is not installed.
  - Try COM2, if it also fails, check Setup configuration and verify that the ports are enabled.
  - Check if any adapter boards are conflicting with ports. If ports are used by an expansion card, then on board ports must be turned off in Setup.
  - Check that cables are connected properly and peripherals are powered ON and configured properly.
  - If problem persists, contact MultiTech's Technical Support Department, refer to Chapter 6 of this manual.

- **Keyboard does not respond to key strokes**
  - Connect keyboard cable to the left round connector on SBC.
  - If cable converter is used to connect a large 5-pin DIN to a small 6-PIN PS/2 DIN, this converter could be bad or of the wrong type.
  - Verify that the keyboard works on a different system.
  - If problem persists, contact MultiTech's Technical Support Department, refer to Chapter 6 of this manual.

- **Invalid Time, Date or Setup**
  - Battery is failing.
  - Last system boot was incomplete. Verify in Setup that configuration is correct and reboot system.
  - If problem persists, contact MultiTech's Technical Support Department, refer to Chapter 6 of this manual.

Diagnostic Tests

The MiniArray™ operates like any stand-alone PC, and can run almost any off-the-shelf diagnostic program. These programs are available at any software re-seller and can quickly help isolate component failures.

Calling Technical Support

For immediate help in finding and fixing MiniArray™ problems, record the error condition and call Multi-Tech's Technical Support department at 1-800-972-2439.

6 Service, Warranty, and Technical Support

Introduction

This chapter starts out with statements about your MiniArray™'s 2-year warranty. The next section, Tech Support, should be read carefully if you have questions or problems with your MiniArray™. It includes the technical support telephone numbers, space for recording your MiniArray™ information, and an explanation of how to send in your MiniArray™ should you require service.

Limited Warranty

Multi-Tech Systems, Inc. (*"MTS"*) warrants that its products will be free from defects in material or workmanship for a period of two years from the date of purchase, or if proof of purchase is not provided, two years from date of shipment. MTS MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by the customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period, or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PURCHASE PRICE FOR DEFECTIVE PRODUCTS.

Warranty Addendum on Service for North American Products

In the event that service is required, products may be shipped, freight prepaid, to our Mounds View, Minnesota, factory (Multi-Tech Systems, Inc., 2205 Woodale Drive, Mounds View, MN 55112, Attn: Repairs, Serial #_____). A Returned Materials Authorization (RMA) is not required. Return shipping charges (surface) will be paid by MTS. Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), a telephone number, and if the product is out of warranty, a check or purchase order for repair charges.

Extended two-year overnight replacement agreements are available for selected products. Please refer to our Overnight Replacement Agreement for details on rates and coverages.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department at 1-800-972-2439. Please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at (800) 328-9717 or (763) 717-5631.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Warranty Addendum on Service for International Products

Distributors should contact Amex, Inc., for information about the repairs for your Multi-Tech product.

Amex, Inc.
2724 Summer Street NE
Minneapolis, MN 55413 U.S.A.
Tel: +(612) 331-3251
Fax: +(612) 331-3180

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department nearest you. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at +(763) 717-5631 in the U.S.A., or a nearby Multi-Tech office which is listed on the “Multi-Tech Corporate Offices” sheet in this International Distributor Resource Kit.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Out of Warranty Repair Costs

Current out-of-warranty repair costs are listed by category on the Multi-Tech web site (www.multitech.com).

Tech Support

Multi-Tech has an excellent staff of technical support personnel available to help you get the most out of your Multi-Tech product. If you have any questions about the operation of this unit, call 1-800-972-2439. Please fill out the information (below), and have it available when you call. If your MiniArray™ requires service, the tech support specialist will guide you on how to send in your MiniArray™.

Recording MiniArray™ Information

Please fill in the following information on your Multi-Tech MiniArray™ . This will help tech support in answering your questions.

MiniArray™ *Model No.:*_____

MiniArray™ *Serial No.:* _____

Application Software Type and Version (e.g., RASExpress, Radius Server)*:*

Please note the status of your MiniArray™ before calling tech support. This status can include screen messages, diagnostic test results, problems with a specific application, etc.

About the Internet

Multi-Tech is a commercial user on the Internet, and we retrieve e-mail messages from on a periodic basis. If you prefer to receive e-mail technical support via the Internet, you can contact Tech Support at the following address:

http://www.multitech.com/_forms/email_tech_support.htm

Multi-Tech's presence includes a Web site at:

http://www.multitech.com

and an ftp site at:

ftp://ftp.multitech.com

Appendices

Appendix A: Back Panel Connector Pinouts

Appendix B: Regulatory Information

Appendix C: Workstation Redirectors -- MCSIWSN and MINMCSI

Appendix D: RADIUS Authentication & User Profile Software

Appendix E: MultiManager Software

Appendix A: Back Panel Connector Pinouts

Introduction

This appendix provides specifications for the various connectors on the back panel of the MiniArray.

VGA 15-Pin Connector

This connector provides video analog data, and horizontal and vertical synchronization signals for VGA monitors.

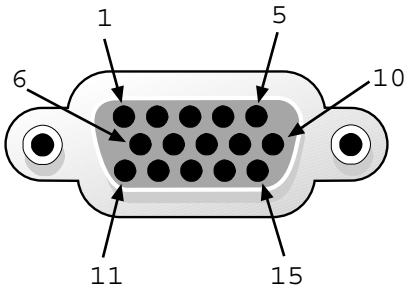


Figure A-1. 15-Pin VGA Connector

Pin Identification

Pin	Description	Pin	Description
1	Analog Red	2	Analog Green
3	Analog Blue	4	VESA Monitor Status Bit 2
5	Digital Ground	6	Digital Ground
7	Digital Ground	8	Digital Ground
9	NC	10	Digital Ground
11	VESA Monitor Status Bit 0	12	VESA Monitor Status Bit 1
13	Horizontal Sync	14	Vertical Sync
15	NC		

9-Pin DB9 (COM 1) Connector

This connector attaches the SBC board to the COM 1 serial port.

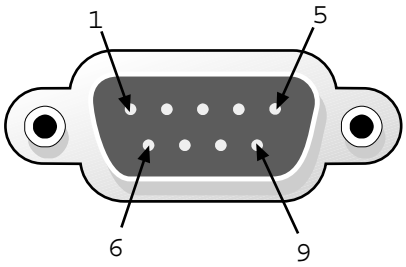


Figure A-2. 9-Pin DB9 COM 1 Connector

Pin Identification

Pin	Description	Pin	Description
1	DCD	2	RX Data
3	TX Data	4	DTR
5	Ground	6	DSR
7	RTS	8	CTS
9	RI		

6-Pin Circular Jack

This connector connects the keyboard to the SBC board.

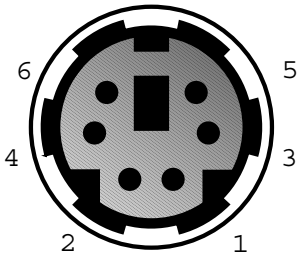


Figure A-3. 6-Pin Mini-DIN Keyboard Connector

Pin Identification

Pin	Description	Pin	Description
1	+Keyboard Data	2	NC
3	GND	4	+5V DC
5	+Keyboard Clock	6	NC

Ethernet NIC Card Connector

RJ-45 Connector

This connector ties the EN-Series Ethernet board to a 10BASET network.

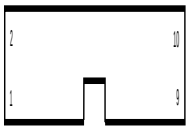


Figure A-5. RJ-45 Connector (viewed from connector side)

Pin Identification

Pin	Description	Pin	Description
1	+ Transmit Data	2	- Transmit Data
3	+ Receive Data	4	No Connect
5	No Connect	6	-Receive Data
7	No Connect	8	No Connect

ISI Board Connector

DB78S Connector

This connector provides the serial, control and handshaking signals for all modems connected to the MiniArray.

Figure A-6. DB78S Connector (female)

Pin Identification

Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	DTR8	2	-SOUT6	3	DTR6	4	CTS6
5	DSR5	6	DCB8	7	RI8	8	-SIN6
9	CTS7	10	-SOUT4	11	-SOUT3	12	RTS3
13	DTR3	14	RTS4	15	RI2	16	CTS1
17	-SIN2	18	DCD4	19	RI4	20	RI3
21	RTS5	22	DTR5	23	DCD6	24	RI6
25	CTS5	26	DSR8	27	-SIN8	28	-SIN5
29	DSR7	30	-SOUT1	31	RTS2	32	DTR2
33	DCD2	34	DSR6	35	DCD1	36	RI1
37	-SIN3	38	DSR4	39	DCD3	40	-SOUT5

41	RTS6	42	DSR6	43	DCD5	44	RI5
45	CTS6	46	-SIN7	47	RI7	48	DCD7
49	DTR1	50	-SOUT2	51	RTS1	52	DTR4
53	CTS2	54	DSR1	55	-SIN1	56	-SIN4
57	CTS4	58	DSR3	59	CTS3	60	RTS8
61	DTR7	62	RTS7	63	-SOUT7	64	-SOUT8
65	+12v	66	+12v	67	+12v	68	GND1
69	GND2	70	GND3	71	GND4	72	GND5
73	GND6	74	GND7	75	GND8	76	-12v
77	-12v	78	-12v				

Pin-out assignments for the 10Base-T connector are as follows:

10-pin	**Signal**	**8-pin**
1	NC	NA
2	Tx+	1
3	Tx-	2
4	Rx+	3
5	NC	4
6	NC	5
7	Rx-	6
8	NC	7
9	NC	8
10	NC	NA

Multi-Tech's products use a 10-pin 10Base-T connector. Some manufacturers use an 8-pin format. This format is compatible with the EN301CT16d, and will plug in and work without modification. If an 8-pin RJ-45 is used with the EN301CT16c, use the pin assignments shown in the 8-pin column.

34-Pin Floppy Disk Drive Connector

This connector provides signal and data connection between the floppy drive and the SBC board.

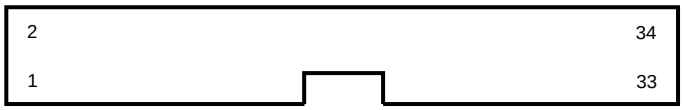


Figure A-4. Floppy Disk Connector

Pin	**Description**	**Pin**	**Description**
1	Ground	18	Direction (Stepper Motor)
2	RPM/RWC	19	Ground
3	Ground	20	Step Pulse
4	Not Used	21	Ground
5	Ground	22	Write Data
6	Not Used	23	Ground
7	Ground	24	Write Enable
8	Index	25	Ground
9	Ground	26	Track 0
10	Motor Enable 1	27	Ground
11	Ground	28	Write Protect
12	Drive Select 2	29	Ground
13	Ground	30	Read Data
14	Drive Select 1	31	Ground

15	Ground	32	Select Head
16	Motor Enable 2	33	Ground
17	Ground	34	/DCHNG

Printer Port Connector

This 25-pin connector provides parallel printer data and control signals to and from the SBC board.

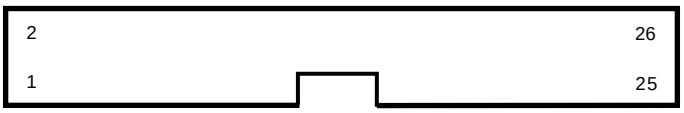


Figure A-5. Printer Port Connector

Pin	Description	Pin	Description
1	-Strobe	10	-Acknowledge
2	+Data Bit 0	11	+Busy
3	+Data Bit 1	12	+Paper End
4	+Data Bit 2	13	+Select
5	+Data Bit 3	14	-Auto Feed
6	+Data Bit 4	15	-Error
7	+Data Bit 5	16	-Initialize Printer
8	+Data Bit 6	17	-Select Input
9	+Data Bit 7	18-25	Ground

COM 2 Port Connector

This 10-pin connector transfers serial data to and from the COM 2 port.

Figure A-6. COM 2 Port Connector

PinSignal	Name (Direction)
1	Carrier Detect (Input)
2	Data Set Ready (Input)
3	Receive Data (Input)
4	Request To Send (Output)
5	Transmit Data (Output)
6	Clear To Send (Input)
7	Data Terminal Ready (Output)
8	Ring Indicator
9	Signal Ground
10	Unused

Hard Disk Connector

This connector supplies hard disk drive signals which interface with the software I/O drivers to provide the read/write functions.

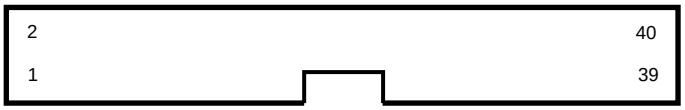


Figure A-7. Hard Disk Connector

Pin	Description	Pin	Description
1	/Reset	21	NC
2	Ground (GND)	22	Ground (GND)
3	Data Bit 7 (SD7) 23	-I/O Write (-IOW)	
4	Data Bit 8 (SD8) 24	Ground (GND)	
5	Data Bit 6 (SD6) 25	-I/O Read (-IOR)	
6	Data Bit 9 (SD9) 26	Ground (GND)	
7	Data Bit 5 (SD5) 27	IOCHRDY	
8	Data Bit 10 (SD10)	28	ALE\
9	Data Bit 4 (SD4) 29	NC	
10	Data Bit 11 (SD11)	30	Ground (GND)
11	Data Bit 3 (SD3) 31	IRQ14	
12	Data Bit 12 (SD12)	32	/IOCS16
13	Data Bit 2 (SD2) 33	Address Bit 1 (SA1)	
14	Data Bit 13 (SD13)	34	NC
15	Data Bit 1 (SD1) 35	Address Bit 0 (SA0)	
16	Data Bit 14 (SD14)	36	Address Bit 2 (SA2)
17	Data Bit 0 (SD0) 37	Chip Select 0 (-CS0)	
18	Data Bit 15 (SD15)	38	Chip Select 1 (-CS1)
19	Ground (GND)	39	/HDLED
20	NC	40	Ground (GND)

Appendix B
Regulatory Information

FCC Regulations for Telephone Line Interconnection

1.This equipment complies with Part 68 of the Federal Communications Commission (FCC) rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

2.As indicated below, the suitable jack (Universal Service Order Code connecting arrangement) for this equipment is shown. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.

An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.

3.The ringer equivalence number (REN) is used to determine the quantity of devices which may be connected to the telephone line. Excessive REN's on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN's should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REN's, contact the telephone company to determine the maximum REN for the calling area.

4.If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

5.The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.

6.If trouble is experienced with this equipment (the model of which is indicated below) please contact Multi-Tech Systems, Inc. at the address shown below for details of how to have repairs made. If the equipment is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved.

7.No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.

8.This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

9. If do required, this equipment is hearing-aid compatable.

Manufacturer:	Multi-Tech Systems, Inc.
Model Number:	ISI3334/4, ISI3334/EC and ISI3334/8
FCC registration number:	AU7USA-23834-MM-E
Ringer Equivalence No:	0.3B
	Modular Jack (USOC)
	RJ11C or RJ11W (single line)
Service Center in USA:	Multi-Tech Systems Inc.
	2205 Woodale Drive
	Mounds View, MN 55112
	Voice (763) 785-3500/
	FAX (763) 785-9874

Canadian Limitations Notice

Notice: The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination of a interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

Notice: The Industry Canada label identifies certificated equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Compliance with BABT Requirements

Approved for connection to telecommunications system specified in the instructions for use subject to the conditions set out in them.

Warning: Interconnection directly, or by way of other apparatus, of ports marked "SAFETY WARNING see instructions for use" with ports marked or not so marked may produce hazardous conditions on the network. Advice should be obtained from a competent engineer before such a connection is made.

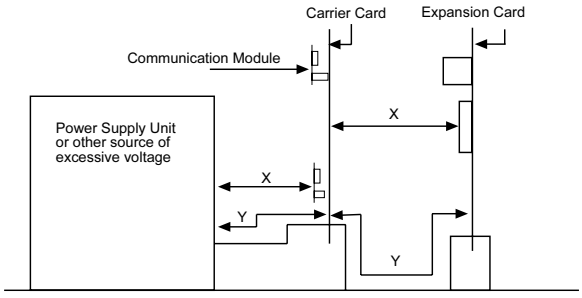
It is a condition of approval that the power required by the host and the total of all adapter cards installed within the host environment, together with any auxiliary apparatus, does not exceed the power specification as stated in the Technical Reference Material of the host apparatus.

The power requirements for the MULTIMODEMISI are:
Modem operating voltages: +12V D.C., -12V D. C., +5V D.C.
Modem Power Consumption: 8 Watts

In order to maintain the independent approval of this card, it is essential that when other option cards are introduced which use or generate a hazardous voltage, the minimum creepages and clearances specified in the following table are maintained. A hazardous voltage is one which exceeds 42.4V peak a.c or 50V d.c. If you have any doubt, seek advice from a competent engineer before installing other adapters into the host equipment.

The equipment must be installed such that with the exception of connection to the host, clearance and creepage distances shown in the following table are maintained between the card and any other assemblies which use or generate a voltage shown in that table. The larger the distance shown in brackets applies where the local environment within the host is subject to conductive pollution or dry nonconductive pollution which could become conductive due to condensation. Failure to maintain these minimum distances would invalidate approval.

Clearance (mm)	Creepage (mm)	Voltage used or Generated by Host or other Cards
2.0	2.4 (3.8)	Up to 50 Vms or Vdc
2.6	3.0 (4.8)	Up to 125 Vms or Vdc
4.0	5.0 (8.0)	Up to 250 Vms or Vdc
4.0	6.4 (10.0)	Up to 300 Vms or Vdc



Example Diagram Showing Creepage & Clearance Distances

Fig. B-1. Example Diagram Showing Creepage and Clearance Distances

Except at the edge connector which plugs into the host's expansion slot, clearance distance (Xmm) and creepage distance (Ymm) as given in the table above, must be maintained between the communication card and any assemblies which use or generate hazardous voltage.

This apparatus has been approved for the use of the following facilities:

- Auto-calling
- Loop disconnect and MF dialing
- Phone number storage and retrieval by a predetermined code

• Operation in the absence of proceed indication
• Automatic storage of last number dialed
• Tone detection-busy
• Auto clear from the originating end
• DTR dialing
• Modem
• PBX timed break register recall

European Low Voltage Directive

When correctly installed and maintained, the modem will present no hazard to the user. When correctly installed the modem will be connected to the PSTN or a PW and to a Data Terminal Equipment (DTE), whose modem connections comply with CCITT recommendation V28. The DTE connections are therefore taken to be safe voltages (less than ± 30 volts).

Ports which are capable of connecting to other apparatus are defined as SELV. To ensure conformity with EN41003, ensure that these ports are only connected to ports of the same type on other apparatus.

Compliance with BS6305 Clause 6.2, BS6320 Clause 7.2, and BABT/ SITS/82/005S/D

a. The modem is suitable for connection to the Public Switched Telephone Network (PSTN) provided by British Telecommunications plc or Kingston Communications (Hull) plc. Circuit supply by British Communications, Mercury Communication, or Hull City Council. Only direct exchange lines may be used, not shared service.

b. The modem is suitable for household, office, and similar general indoor use. It is not suitable for use as an extension to a payphone.

c. BT lines supplied must support either loop disconnect or multifrequency tone signalling.

d. REN (Ringer Equivalence Number).

The REN value of a unit is calculated from 3/n where n is the total number of units which can be connected in parallel which will still cause the standard bell (as defined in BS6305 Appendix D) to ring.

REN values of less than 0.3 cannot be assigned.

REN = 1

If a telephone or other device is connected in parallel with the modem, the combined REN must not exceed 4. A BT supplied telephone may be assumed to have REN of 1.0 unless otherwise noted.

The approval of this modem for connection to the British Telecom public switched telephone network is INVALIDATED if the apparatus is subject to any modification in any material way not authorized by BABT or if it is used with or connected to:

i. internal software that has not been formally accepted BABT.

ii. external control software or external control apparatus which cause the operation of the modem associated call set-up equipment to contravene the requirements of the standard set out in BABT/SITS/82/005S/D.

All other apparatus connected to this modem and thereby connected directly or indirectly to the British Telecom public switched telephone network must be approved apparatus as defined in Section 22 of the British Telecommunications Act 1984.

Compliance with BS6789: Section 3.1 and Part 2

a. The modem is not capable of allowing Auto Call using '999' or other PABX emergency numbers.

b. Modes other than modes 1, 2, or 3 should not be used on the BT PSTN. This modem is a mode 1 device.

c. Users are advised to check the numbers entered during the Auto Call set up phase prior to dialing.

d. The user should not issue any sequence of commands to the modem which would cause the modem to exceed the maximum allowable pause of 8 seconds from the time the modem goes off hook until dialing begins.

e. For correct operation of the call progress monitor, the power has to be properly connected and switched on.

Compliance with BS6328 Part 1

a. The modem is not suitable for use on circuits with British Telecommunications signaling at a normal frequency of 2280 Hz.

b. The modem does not require signaling or otherwise employ the frequency range dc to 200 Hz.

c. The modem does not require dc from the Private Circuit for correct operation. The modem may be damaged if connected, in a private circuit mode, to a circuit supplying dc current (the maximum permissible direct current is zero amps).

Modem CE Mark, EMC, and Safety Compliance

The CE mark is affixed to the enclosed Multi-Tech product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

both amended by

Council Directive 93/68/EEC of 22 July 1993 on the harmonization of CE marking requirements.

Appendix C: Workstation Redirectors -- MCSIWSN and WINMCSI

Introduction

***Note**: This material is for IP or IPX network users only.*

This section describes how a client PC can use MCSI (pronounced *miksee*) software redirectors to access theRASExpress server's modems when using standard communications software.

MCSIWSN.EXE is a DOS application for use with IPX networks only. WINMCSI.EXE is a Windows application for use with either IPX or IP networks. COMMAP.EXE can be used with either IPX or IP networks.

To install MCSIWSN for DOS, see "Installing MCSIWSN for DOS" below. To install WINMCSI for Windows, see "Installing and Configuring the WINMCSI Redirector" below.

Installing MCSIWSN for DOS

This procedure allows you to establish a connection between a client PC and the RASExpress server, after which you can run any communications software that has a MCSI/NASI/NCSI compatible interface.

1. Turn on your client PC and log in to your LAN.
2. Insert the workstation diskette into your floppy disk drive. Change to your floppy disk drive, e.g., A:\, and type **install**.
3. The **Installation Options** menu appears.

   Make sure only **Software Redirector for DOS (MCSI)** is checked, then press ESC to continue.
4. The **Enter Pathname for MCSI files** window appears. Press ENTER to accept the default (C:\MCSI), or type a different path and press ENTER.
5. MCSI is installed in the designated directory. When the installation is complete, the message **AsyncGateway MCSI Installation Complete** appears. Press any key to continue. The message: **Installation of client is completed** appears. Press any key to return to the DOS prompt.

Using the MCSIWSN Redirector

6. Change to the subdirectory containing the MCSIWSN files, e.g., C:\MCSI.
7. Type **mcsiwsn** (the program name for the redirector software) and press ENTER.

   *Note: Use the **-P** parameter (e.g., **mcsiwsn -p**) to display the **Inbound /Outbound Modem Type** window. For more information on MCSIWSN's command line parameter options, see "MCSIWSN Command Line Operation" above.*

The redirector software loads, and the following message appears:

Initializing, please wait...

MCSI Program is resident

8. Type **logon** and press ENTER. The following message appears:

Enter your user name:

You can use a preferred communications server name if more than one communications server is on the network, e.g., **logon server_1/user1**.

9. Type **user1** (or your RASExpress user name) and press ENTER. If a password has been assigned to the user name, the following message appears. (If a password was not assigned, then the message in step 5 appears.)

   Enter your password:

10. Type **user1** (or your RASExpress password) and press ENTER. Note that the password is case-sensitive. The following message appears:

    Login Completed.

11. You are now connected to the RASExpress server, and can run any MCSI-compatible communications software to use one of the server's modems.

To unload MCSIWSN from memory, change to the directory where MCSIWSN is located, type **mcsiwsn -u**, and press ENTER. MCSIWSN will unload from memory, provided that other memory-resident programs have not been loaded after MCSIWSN was loaded. If other memory-resident programs were loaded after MCSIWSN, then you must unload them in reverse order before you can unload MCSIWSN.

MCSIWSN Command Line Operation

MCSIWSN command line parameters allow you to operate MCSIWSN as an INT14 software redirector, make MCSIWSN Novell NASI-compatible, turn on the popup **Inbound Outbound** menu, select **Inbound** as default connection type, unload MCSIWSN from memory, and enable the command interpreter option for applications that make use of this option.

12. Log into your network. This automatically establishes a communications link between your client PC and the RASExpress server.
13. Change to the subdirectory containing the MCSIWSN files.
14. Type **mcsiwsn ?** at the DOS prompt and press ENTER. The following help screen appears:

    Usage is:

    -U For uninstalling this program.
    -F If you want to search for active modem servers.
    -C Turns on Command Interpreter option.
    -I Connection Manager will connect as inbound.
    -P Display Connection Manager popup.
    -N<1 to 9> Number of multiple connections operational
    -A Load TSR as an INT14.
    -X Novell NASI compatible.
    -C<1 to 9> Number of Servers to wait when it is inbound.

You can type MCSIWSN parameters in any order, but there must be a space before each one (e.g., **MCSIWSN -I -P -N5**).

-U Unloads MCSIWSN.

-F Searches for active modem servers.

-C Enables the command interpreter. An additional 5 KB of memory is used by MCSIWSN when the command interpreter is enabled. It allows applications programs that provide a command interpreter interface to issue the following commands:

CONNECT, DISCONNECT, HELP, LIST, RESUME, SET, SHOW, SWITCH

-I Connection Manager connects as inbound. When setting up for inbound-only connections, adding this parameter string to the command removes the need for operator intervention to select **INBOUND** on the Connection Manager screen.

-P Adding this parameter to the command line turns on the Connection Manager **OUTBOUND/INBOUND** screen.

-N*x* This option sets the maximum number of connections that can be operational at one time. X represents a number from 1 through 9 (default = 1). Increasing the number of multiple connections expands the MCSIWSN memory requirement by up to 10 KB.

-A This parameter enables MCSIWSN to become an INT14-compatible interface when the COMS14.EXE program is run. See "Using MCSIWSN as an INT14 Redirector" in the RAS*Express* User Guide.

-X This parameter makes MCSIWSN compatible with Novell NASI-based software

-M This parameter allows you to wait on a specific line when it is in inbound mode

-S*x* This option allows a user to wait on multiple servers on the same network when it is in inbound mode. X is the number of servers available, in the range 1–9 (default = 1).

15. Select the command line options needed for the client PC on which MCSIWSN will be run. Then type **mcsiwsn** followed by the selected parameter string.

16. When the **MCSI is Resident** message appears, type **logon** and press ENTER. The following message appears:

Enter your user name:

17. Type **user1** or another valid user name and press ENTER. If a password is assigned to the user name, the following message appears. (If a password is not assigned, go to step 8.)

```
Enter your password:
```

18. Type **user1** or the valid password for the user name you entered, and press ENTER. Note that the password is case-sensitive. The following message appears:

```
Login Completed.
```

19. You are now connected to the RASExpress server, and can use the RASExpress server's modems by running any MCSI-compatible software.

Using MCSIWSN as an INT14 Redirector

Running MCSIWSN on a workstation as an INT14 redirector enables the workstation to use communications software that provides a network INT14 interface.

This section is for users whose LAN PCs will be running a LAN network version of INT14-compatible communications software. Before you can begin:

- You must have your RASExpress user name and password, which was assigned by the LAN system administrator when the RASExpress server was installed.
- The RASExpress server and the client PC must be properly connected to a LAN with IPX capability, and you must have access to a network version copy of a dial-in or dial-out communications program with a MCSI-compatible interface.

***Note**: The INT14 that is used in Windows is not the same as a network INT14, and does not connect to the gateway.*

20. Turn on your client PC and log into your LAN.
21. Change to the subdirectory containing the MCSIWSN files, i.e., C:\MCSI.
22. Type **mcsiwsn -a** and press ENTER. This loads MCSIWSN and allows it to operate as an INT14 redirector. A message similar to the following appears:

```
Initializing, please wait...
 INT14 Program is Resident.
```

23. Type **logon** and press ENTER. The following message appears:

```
Enter your user name.
```

    ***Note**: If you have more than one RASExpress server on your network and you are not listed as a user on every RASExpress server, then you must type the following command: **logon** ServerName\UserName.. E.g., **logon server_1\user1**.*

24. Type **user1** (or your valid RASExpress user name) and press ENTER. If a password has been assigned, the following message appears. (If a password was not assigned, go to step 7.)

```
Enter your password.
```

25. Type **user1** (or your valid RASExpress password) and press ENTER. Note that the password is case-sensitive. The following message appears:

```
Login Completed.
```

26. If the RASExpress server is the only remote access server on your LAN, then type **coms14 -c com*n* Inbound * * *** (*n* is replaced by the number 1, 2, 3, or 4, which selects one of the COMS14 COM ports) or **coms14 -c com*n* Outbound * * *** and press ENTER (**Inbound** or **Outbound** must be specified). This connects you to a line on the RASExpress server.

    Note: If you have more than one remote access server on your network, see "COMS14 Command Line Parameters" on this page.

27. You are now connected to the RASExpress server and can run any INT14-compatible software. Follow the software's instructions to establish the software's INT14 connection to the RASExpress server's modem.

COMS14 Command Line Parameters

To list the COMS14 command line parameters, type **coms14 ?**. The following information appears.

```
Usage : coms14 -l [Server Name]
         (for listing services)

           : coms14 -c COM<n> <LineType> <SpecificName>
   <GeneralName> <ServerName>
         (for establishing a connection)

           : coms14 -d COM<n>
         (to disconnect)
```

```
: coms14 -m
    (to list mapping of local COM ports to Network
ports)
```

COMS14 -L [*ServerName*]

Type **coms14 -L** for a list of available communications servers.

Type **coms14 -L** [***ServerName***], e.g., **coms14 -L server_1**, for a list of services at an individual server similar to that shown below:

```
List of services at the server SERVER_1

 GENERAL NAME    SPECIFICNAME  STATUS

      MODEM                    LINE1        FREE
```

COMS14 -C COM*n LineType SpecificName GeneralName ServerName*

Type **coms14 -c com*n*** (*n* = 1, 2, 3, or 4), followed by its argument string, to connect to one of the four COM ports (COM1, COM2, COM3, COM4) allowed by INT14 software.

LineType	Identifies whether the session will be inbound or outbound. The *LineType* position must be filled by **inbound**, **outbound**, or an asterisk. The latter indicates that the line type last selected by the user is to be used.
SpecificName	Identifies the specific name assigned to the port on the RASExpress server. This position must contain either the specific name assigned to the RASExpress port (the default specific name for port one is B1_LINE1) or it must contain an asterisk, which indicates that the first available specific name is to be used. The specific name is used when a specific modem is to be used on a communications server.
GeneralName	Identifies the general name assigned to the port on the RASExpress server. This position must contain either the general name assigned to the RASExpress port (e.g., MODEM) or it must contain an asterisk. The latter indicates that the first available specific name is to be used. The general name is used when more than one style of modem is used on a communications server, e.g., an MT2834BA and an MT2834ZDX.
ServerName	Identifies the server name assigned to the RASExpress server. This position must contain either the server name (e.g., SERVER_1), or it must contain an asterisk. The latter indicates that the first available server is to be used. The server name is used when more than one RASExpress server is on a network.

COMS14 -D COM*n*

Type **coms14 -d com*n*** (*n* = 1, 2, 3, or 4) to disconnect from the COM port to which you were connected, i.e., COM1, COM2, COM3, or COM4. The following message appears.

```
Port is disconnected.
```

COMS14 -M

Type **coms14 -m** to see which of the four COM ports are mapped to network ports by INT14 software. A message similar to the following appears.

```
Mapping of logical COM ports to network ports

LOCAL PORT  STATUS  GEN'L NAME SPECIFIC NAME SERVER NAME

   COM1     BUSY     MODEM        LINE1        SERVER_1
   COM2     FREE
   COM3     FREE
   COM4     FREE
```

Installing and Configuring the WINMCSI Redirector

The WINMCSI modem-sharing program manages access to a modem for inbound and outbound calls. It allows Windows communications software packages that do not support INT6B or INT14 to connect to Multi-Tech gateways such as RASExpress. It also detects other compatible communications servers on your network and displays the resources they provide to eligible LAN users.

WINMCSI Installation

Windows 3.1, Windows for Workgroups 3.11, Windows95/98, or Windows NT:

1. Turn on your client PC and log in to your LAN.
2. Start Windows.
3. Insert the Workstation Redirectors diskette into your floppy disk drive.

Windows 3.1 or Windows for Workgroups 3.11:

4a. In Program Manager, click **File**, **Run**.

4b. In the **Command Line** box, type **a:\install**. Click **OK**.

4c. Go to step 5.

Windows95/98/NT:

4a. Click **Start**.

4b. Point to **Settings**.

4c. Click the Control Panel icon.

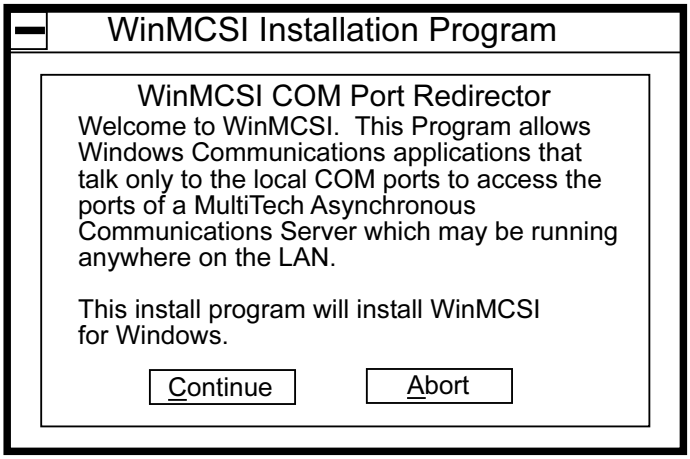
4d. Double-click the Add/Remove Programs icon.

4e. The **Install/Uninstall Program** menu appears. Click **Install**.

4f. Click **Next**. If you want to install WINMCSI as a 32-bit program, let Windows locate the proper Install.exe file on the client disk in your floppy drive. If you want to install WINMCSI as a 16-bit program, type **a:\winmcsi\install.exe**.

4g. Click **Finish**.

5. The WINMCSI Installation Program window appears.



6. To continue with the WINMCSI installation, click **Continue** and go to step 7.

   If you do not want to install WINMCSI, click the **Abort** button .

7. The **WINMCSI Install Configuration** window appears.

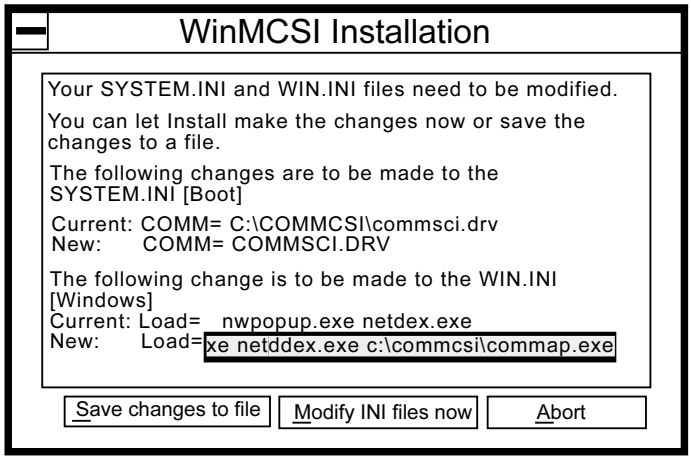
   In the **Destination Directory** box, type the name of the directory where you want to install WINMCSI, if you do not want to accept the default, C:\COMMCSI. Under **Network Type**, select the appropriate network type (IPX, NetBIOS, or IP).

   *Note**:** If you choose **IP** in the **Network Type** box, you must have a TCP/IP protocol active with the default IP router matched with the local IP address of the RASExpress server.*

8. Click **Continue**.

9. When the **Installing Multi-Tech WINMCSI** dialog box appears, click **Install**.

10. When installation is complete, the **WINMCSI Installation** dialog box appears.



11. Click **Modify INI Files Now** to have WINMCSI make changes to your SYSTEM.INI and WIN.INI files.

    Click **Save Changes to File** to have WINMCSI make a copy of the changes to be made and store them in a file. You must make the changes yourself before you can run WINMCSI.

    A screen appears later that tells you your installation is complete, and where your WIN.INI and SYSTEM.INI files are backed up. If **IP** was selected in the **WINMCSI Install Configuration** dialog box, the screen also asks if you want to set up the IP server list. Answer appropriately.

12. The following message appears:

    ```
    Do you want to login to Multi-Tech Asynchronous Communication
    server when WINDOWS comes up?
    ```

    Answer appropriately.

13. The following message appears:

    ```
    Do you want to Map now?
    ```

    Click **Yes** if you want to map your COM Ports now, and go to step 14.

    Click **No** if you want to map your COM Ports when you start WINMCSI, then go to step 15.

14. The **COM Port to MCSI Mapping** window appears.

    - If you want the first available line, click **Map**, then click **Close**, and go to the next section.
    - If you want a specific line, select a COM port in the **Local Port** list, then select the line to which you want to map the COM port. The status message `Mapped to MCSI` should appear above the **Local Port** list.

    Note: *If a serial mouse is connected to COM1, you must select a different local port.*

    - Click **Unmap** if you want to unmap a line.
    - Click **Search** to search for lines on a server.
    - Click **Close** when finished.

15. The following message appears:

    ```
    WINMCSI Successfully installed. Click OK.
    ```

16. A message appears that tells you where your old SYSTEM.INI and WIN.INI files have been backed up. It also tells you to restart Windows. Click **Restart Windows**.

Running the WINMCSI Workstation Software

Before running data communications software, LAN users should use WINMCSI to log on to the communications server.

To log on to the communications server from a workstation

17. ComMap should start automatically if the WIN.INI file was modified during installation. To start ComMap manually, double-click the ComMap icon in the MultiTech MCSI program group (Windows 3.1x) or Start menu (Windows 95/98/NT).

18. If you have not previously done so, select the **Setup** menu to configure ComMap.

    Network Type. The **Network Type** dialog box shows your current network type (IP, IPX, or NetBIOS). To change the network type, click the appropriate type for your network. Click **OK** when finished. You must restart Windows if you change this setting.

    Note**:** Do not change the network type unless the network has changed. Also, make sure that your SYSTEM.INI file contains device drivers specific to the

selected network type.

Connect Timer. The **MCSI Connect Timer** dialog box shows the default value of the connect timer in the Enter **Connect Timer Value** box. This value sets the time in seconds, in the range 0 through 60, that the MCSI emulator waits for a MCSI device to become available. To change the value of the connect timer, type a different value in the box. Click **OK** when finished.

Baud Change. A check mark appears next to the **Baud Change** command to indicate that an application can change the baud rate or other port parameters. If **Baud Change** is unchecked, then an application cannot change the baud rate or other port parameters. To change this setting, click **Baud Change**.

Default Login. Use the **Default Login Parameters** dialog box to automatically log into a specific server whenever Windows runs. Select a server from the **Available Servers** box, then type a user name and optional password. Click **OK** when finished. ComMap saves these login parameters in your COMMCSI.INI file.

> ***Note:*** *You can use a text editor to edit the COMMMCSI.INI file, however you cannot change the password because the password field is encrypted. Editing the password will corrupt the file.*

If there are no servers listed in the **Available Servers** box, type a server name in the **Server Name** box, then click the **Search** button to search for a match. You can use * and *?* as wild card characters.

Port Type. Use this command to designate your mapped ports as **outbound** (available only for calling out) or **inbound** (available only for calling in A port cannot be both outbound and inbound. In Windows 3.1x, all mapped ports have the same port type. In Windows 95/98/NT, however, you can designate one port as outbound and another as inbound.

Appendix D: RADIUS Authentication & User Profile Software

Requirements

Radius Server requires a 486-66 MHz or faster computer, preferably running Microsoft Windows NT Server. Although Radius Server can also run on Windows 95, Windows 98, and Windows NT 4.0 Client, on those operating systems it is not possible to use the NT Server user database. The computer should have a hard disk, a CD-ROM drive, and LAN or WAN access.

Radius Server requires approximately 420 kB on the hard disk and space for the user database.

Installing Radius Login Authentication Software

MultiTech's Radius software allows the MiniArray^{III} RAS Server to operate in conjunction with a general LAN server using Windows 95, 98, or NT4.

1. On the Radius Server computer, exit all Windows programs except Windows Explorer.

2. Insert the compact disc supplied with your Multi-Tech Systems communications server into the computer's CD-ROM drive.

3. If Autorun does not display the installation menu, find Autorun.exe in the root folder of the compact disc, and double-click it. The installation menu appears.

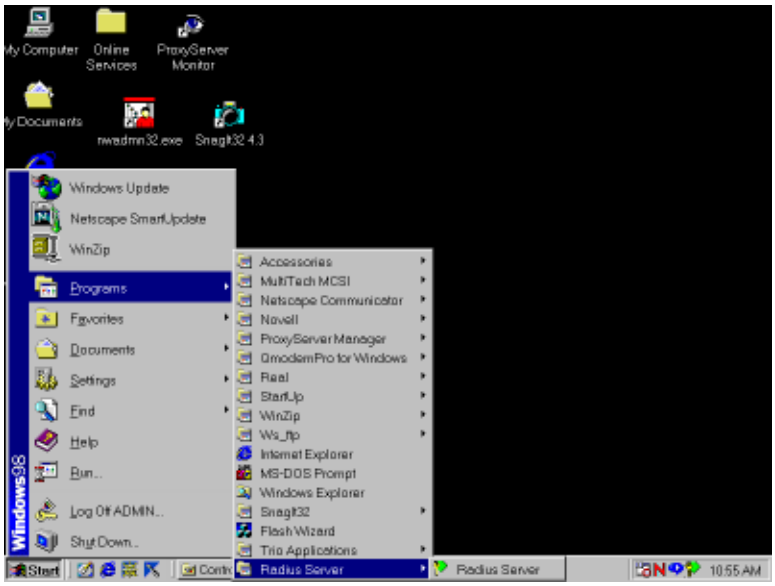
4. In the **Install Software** option, select **Radius Server**. The Multi-Tech Radius Server Setup wizard appears.

5. Follow the instructions in the Setup wizard to install Radius Server.

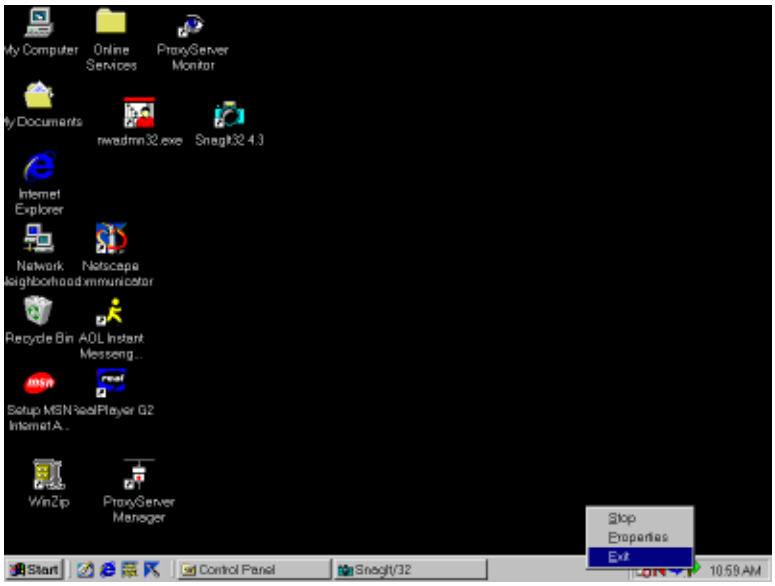
6. When the **Settings** dialog box appears, click **OK**. The default values are appropriate in most cases. You can change these settings any time when Radius Server is running.

7. Click **Finish**.

8. Re-boot the computer. By default, Multi-Tech Radius Service runs automatically on startup. If for any reason the Radius program was shut down, you can launch the program manually from the Windows “Start” menu.



14. To shut down the Radius program, click on the Radius icon at the lower left of the PC screen.



Radius Software: “Clients” and “Users” Files

After installing the Radius software, the administrator must customize the “Clients” file and the “Users” file for use in their specific network system. These files can be found in C:\Program Files\MultiTech Systems\Radius Server. The “Clients” file and the “Users” file can both be opened in Notepad or Wordpad text-processor application programs.

In the “Clients” file, the administrator specifies the IP address of the RAS Server and the “shared secret” known to both the CommPlete 4000 RAS server and to the password authentication server. Entries in the “Clients” file must be in this form:

<IP address of client> <blank or tab(s)> <shared secret> <new line>

The IP addresses should be in dotted notation only. Names are not permitted.

For Windows NT only. In the “Users” file, the administrator lists network users by name and specifies authentication/password parameters. The "users" file can include another file which contains a list of users. The syntax is as follows:

$include <full path to the users file>.

When this command is employed under Windows NT, the authentication server can use the same user database as the host server.

The first line in each user entry contains the following information:

<User name> <Tab> <Check List>

The <User name> field must start from the first column. The <Check List> field can have the following info :

(i). Auth-Type. This field specifies whether the authentication is done locally or by the system (for WindowsNT only). Values: Local or System.

(ii). Password = <The password of the particular user>

Indicates that PAP is the authentication protocol.

(iii). CHAP-Password = <The password of the particular user>

Indicates that CHAP protocol is the authentication protocol.

(iv). Prefix and Suffix.

The "users" file can also have DEFAULT entries which have the user name as DEFAULT. These entries match on all users.

Concerning the notation, Fall-Through = 1 in the reply list,
=> the user entries which follow this user entry are also examined.

For NT Domain Authentication, the check list in the user entries can contain the attribute "Domain-name," to indicate the domain in which the user is authenticated. For NT Domain Auth to work properly, the person who has logged on should be given the rights "Act as part of the operating System" and "Log On as Batch Job".

Appendix E: MultiManager Introduction

Multi-Tech MultiManager is a password-protected Windows 95/98/NT program for SNMP-based administration of RASExpress servers. It can be run from a network client PC or from a dial-in remote-node or remote-control PC. Using MultiManager you can:

- maintain a map of your servers.
- monitor your servers.
- configure your servers.
- manage your communication lines and servers.
- display numeric statistics.
- graph online and offline statistics.
- display selected traps.

Installation

We recommend that you install MultiManager on a workstation that is on the same network as a RASExpress server; however MultiManager can be run from any PC that has Internet access. The workstation must be running Windows 95 or above, or Windows NT 4.0 or above. To install MultiManager:

1. Insert MultiManager Disk 1 into drive A of the management PC. Do not use the RASExpress server computer.
2. In Windows Explorer, open drive A and double-click on **Setup.exe**.
3. Follow the directions in the MultiManager Setup wizard.

Starting MultiManager

1. To start MultiManager, click **Start**, point to **Programs**, point to **MultiManager**, and then click **MultiManager**. Alternately, create a shortcut on the desktop and then double-click it.
2. When MultiManager opens, log in using a valid user name and password. Initially no password is required, but if you opt to use one, you can set it by clicking **Change Password** in the **Edit** menu. Note that the password is case-sensitive.

   To configure a server, you must log in as **supervisor**.
3. If you are starting MultiManager for the first time, click **Edit**, then click **Auto Detect** to map the servers on your network. Valid servers appear in the **Auto Detect** dialog box, the device tree, and the network map.
4. Select a server by clicking it in either the device tree or the network map. When you select a server, the toolbar buttons become active.

Main Window

The main window is the control center for configuring and managing your RASExpress servers.

Title Bar

The title bar shows the IP address of the management workstation and the name and path of the active map file.

Menu Bar

The menu bar contains menus for controlling MultiManager itself, for configuring and managing your servers, for displaying statistics both numerically and graphically, and for editing network maps. Most menu commands can be accessed through the toolbars; except for those selecting the online and offline statistical graphs.

Toolbars

Below the title bar and menu bar are four toolbars, which can be resized, turned on and off, and dragged and docked anywhere. From top to bottom:

- The Configuration toolbar is used to configure a RASExpress server.
- The Statistics toolbar is used to display throughput and other statistics collected since the last reboot of the server.
- The Management toolbar is used to save configuration changes, reboot the server, monitor connections, reset lines, set and display traps, and otherwise manage an active server.
- The Draw toolbar is used to create and edit network maps of your servers.

Device Tree

The device tree, in the pane on the left, displays RASExpress servers and groups in an Explorer-like tree. The manager is at the root of the tree. As in Explorer, you can expand or contract branches by clicking + and – boxes. Just click any server in the tree to select it for configuration or management. If no servers appear in the device tree when you open MultiManager, you can cause MultiManager to look for them by selecting **Auto Detect** from the **Edit** menu.

Network Map

The network map is in the pane on the right. Here you can define and select RASExpress servers, and edit their device attributes by double-clicking their icons. Using the Draw toolbar, you can show relationships among your servers, groups, and LAN and WAN links in a graphic map of your network, which can then be saved to disk.

Status Bar

The status bar displays messages about the status of MultiManager and your SCROLL LOCK, NUM LOCK, and CAPS LOCK keys, and displays the date and time.